



Multi-Modal Communication

14 November 2011

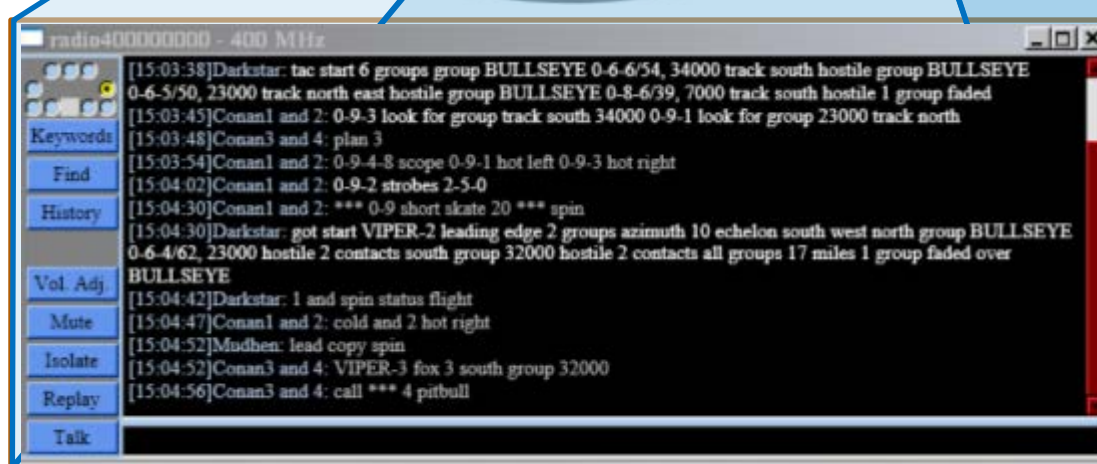
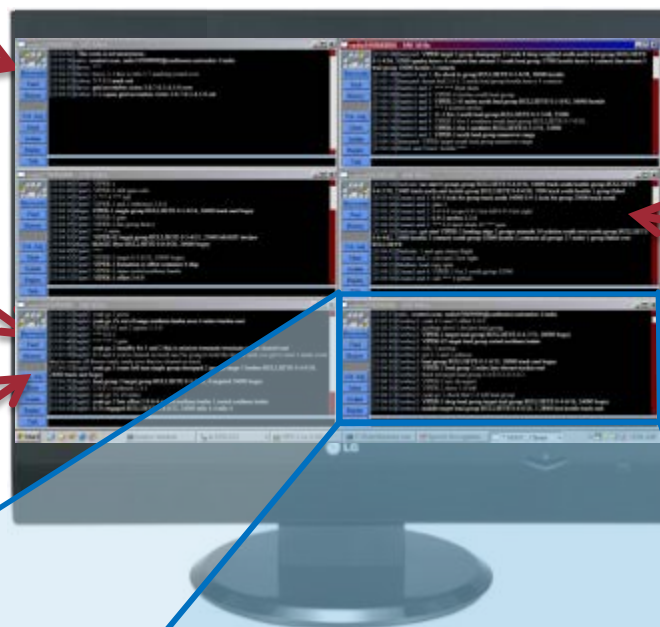
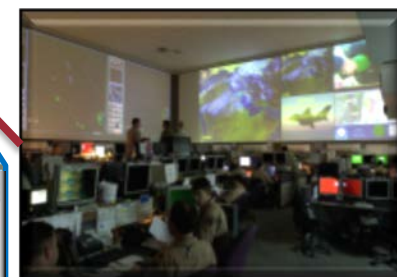


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Multi-Modal Communication





Spatial Audio

- Spatializing communication into virtual locations increases intelligibility by 30 – 40% as well as reduces listener's perceived mental workload

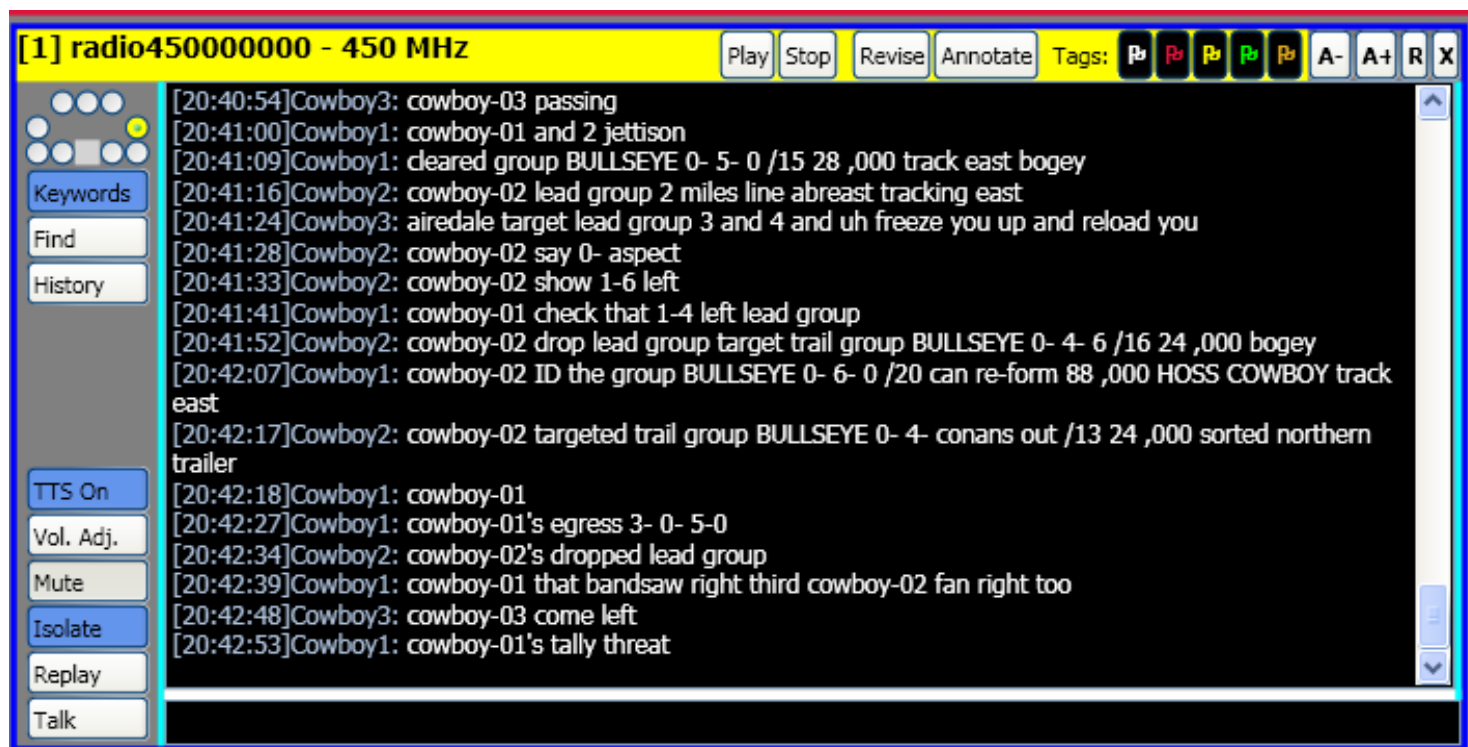




Capture and Display of Radio Messages



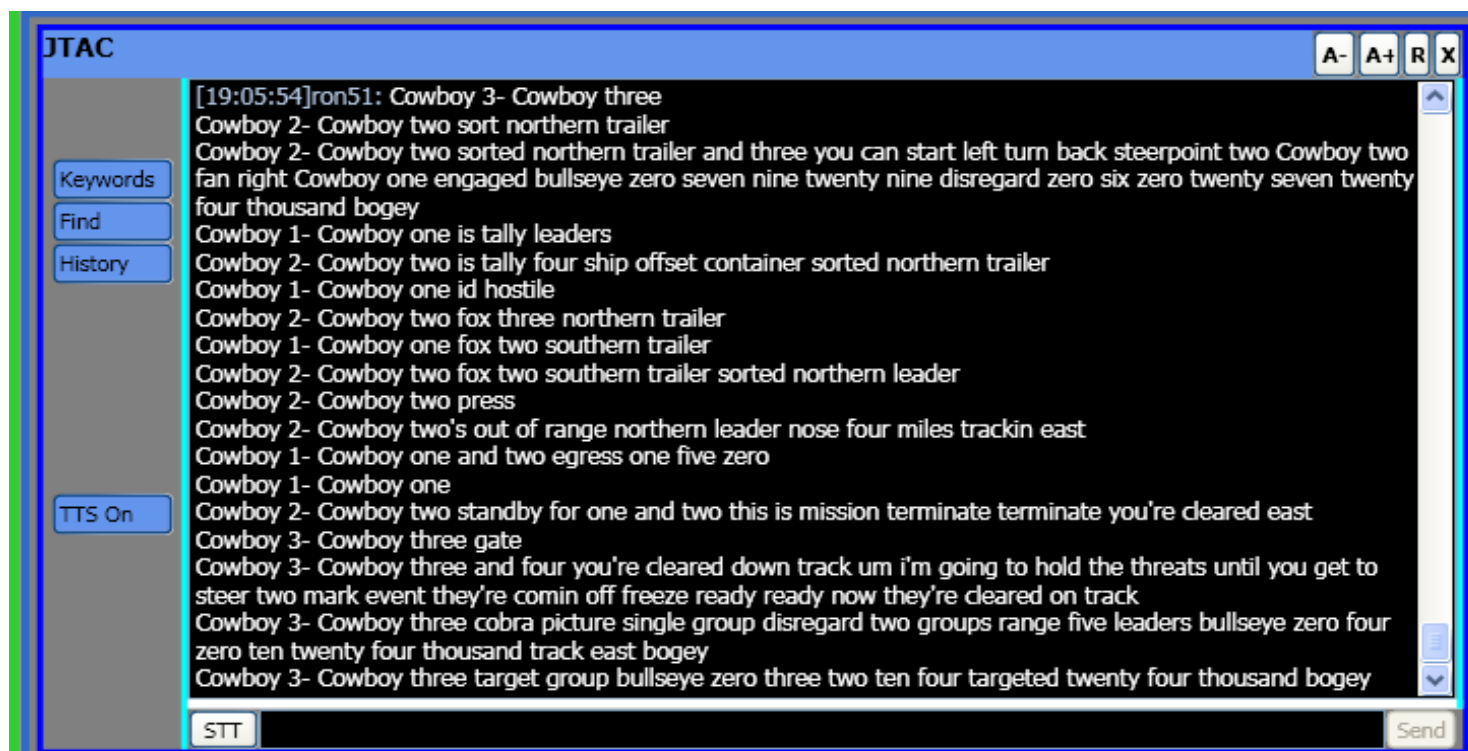
- Real-time speech-to-text transcription of radio messages
- Audio files are recorded and linked to transcription
 - Messages can be replayed in faster than real time
- Messages are timestamp





Text-Chat

- Sends and receives Chat messages
- Chat input via typing or speech-to-text (STT)
- Chat messages can be heard with text-to-speech (TTS)





Edit / Annotate Messages



- ASR is not 100% accurate
- Messages can be edited to reflect the correct information
- Text can be formatted to user's preference
- Ability to copy and paste
- Operators can leave notes to themselves for later review or debriefings

The screenshot displays two windows of a radio communication interface. The top window is titled 'radio450000000 - 450 MHz' and the bottom window is titled 'radio350000000 - 350 MHz'. Both windows have a toolbar with buttons: Play, Stop, Revise, Annotate, and a set of colored buttons (P, B, G, R, A, A+, R, X). Below the toolbar is a list of messages with timestamps and speaker identifiers. The messages are as follows:

radio450000000 - 450 MHz

- [17:12:13]Cowboy1: CONAN trail group BULLSEYE 0- 4- 0 /11 can target 0- 5- 0 /12 conan-04 ,000 track east bogey
- (R)[17:12:17]Cowboy3: cowboy-01 and 2
- [17:12:28]Cowboy2: cowboy-02 say aspect of the lead group track 0- 7- 0-1 and 2-1 conan-03's up and reload ship
- (R)[17:12:36]Cowboy3: cowboy-03 drop lead group gimbal airedale target
 - 1. cowboy-02 drop lead group gimbal airedale target
 - 0. cowboy-03 drop lead group gimbal airedale target
- [17:12:45]Cowboy3: cowboy-03 target trail group now BULLSEYE 0- 5- 5 /28 4 ,000
- cowboy-03 target trail group now BULLSEYE 0- 5- 5 /28 4 ,000
- [17:12:51]Cowboy1: cowboy-01 sorted northern trailer
- [17:13:02]Cowboy3: can a all target group BULLSEYE 0- 6- 5 /28 28 ,000
- [17:13:18]Cowboy3: cowboy-01 and 2 crackle
- [17:13:18]Cowboy1: cowboy-03's 10 miles power hud

radio350000000 - 350 MHz

- [17:14:59]: This room is not anonymous.
- [17:11:07]Rambo1 and 2: cowboy-01 in-place 90 left reference 2- 5- 5 BARNYARD bogey dope
- [17:11:18]Barnyard: CONAN 01 as group BRAA 2- 5- 5 /33 static out of 10 ,000 hostile heavy 4 contacts
- [17:11:25]Rambo1 and 2: rambos push
- (A)[17:11:27]Barnyard: BARNYARD
- [17:11:55]Barnyard: counter are 3- group champagne 15 wide 8 deep weighted south north lead group BULLSEYE 0- 5- 4 /36 32 ,000 spades heavy 4 contacts line abreast 3 cowboy-03 group 27 ,000 hostile heavy 4 contacts line abreast 5 trail group 10 ,000 hostile 2 contacts
- [17:12:03]Rambo1 and 2: rambo-02 group BULLSEYE 0- 5- 6 /38 36 ,000 hostile
- [17:12:13]Barnyard: cowboy-02 locked north lead group hostile heavy 4 contacts
- [17:12:20]Rambo1 and 2: rambos float skate
- [17:12:24]Rambo3 and 4: RAMBO 0- 4- strobes south lead group
- [17:12:33]Rambo1 and 2: cowboy-02 45 miles north lead group BULLSEYE 0- 5- 8 /42 36 ,000 hostile
- [17:12:41]Rambo1 and 2: rambo-02 45 miles north lead group BULLSEYE 0- 5- 8 /42 36 ,000



Accessing Information



- 'Find' function allows operators to search for specific words or phrases
- Flag lines of communication for easy retrieval
- 'History' goes to particular times

The screenshot displays two windows of a radio communication interface. The top window, titled "[3] radio300000000 - 300 MHz", shows a list of communication logs with timestamps and call signs. The bottom window, titled "[12] radio450000000 - 450 MHz", also shows a list of communication logs. Red arrows point from the text on the left to specific features in the interface: one points to the 'Find' button in the top window, another points to a line of communication in the top window, and a third points to the 'History' button in the bottom window.



Keyword

- User defined keywords are highlighted
- Counts number of messages since channel was last visited

The screenshot shows a radio monitoring interface with a yellow header bar displaying "[18] radio300000000 - 300 MHz". On the left side, there is a control panel with buttons for "Keywords", "Find", "History", "TTS On", "Vol. Adj.", "Mute", "Isolate", "Replay", and "Talk". The main display area shows a list of messages with timestamps and text. Keywords are highlighted in yellow and red. A red arrow points from the "Keywords" button to the "Keywords" field in the message list. Another red arrow points from the "Find" button to the "Find" field in the message list.

[20:34:36]Eagle3: eagle-01 and 2 gate
[20:34:45]Eagle2: eagle-02 say aspect of the lead group track 0- 7- 0 want bandsaw 2 untargeted 0 02
[20:34:53]Eagle3: hud eagle-03 drop lead group gimbal cobra uh target
[20:35:03]Eagle3: eagle-03 target trail group now **BULLSEYE** 0- 5- 5 /28 24 ,000
[20:35:06]Eagle1: eagle-01 sorted northern trailer
[20:35:16]Eagle3: cobra targeted lead group **BULLSEYE** 0- 6- 5 /28 28 ,000 track east bogey
[20:35:21]Eagle3: eagle-01 and 2 shackle
[20:35:27]Eagle1: eagle-03's 10 miles power hud 30
[20:35:38]Eagle3: eagle-03's engaged **BULLSEYE** 0- 6- 2 /25 24 ,000 tally 2-4 tally 2
[20:35:41]Eagle1: eagle-01 and 2 cross turn
[20:35:47]Eagle3: eagle-03's ID hostile hostile
[20:35:52]Eagle2: eagle-02 fox-2 northern trailer
[20:35:58]Eagle3: eagle-03 fox southern trailer
[20:36:04]Eagle3: eagle-03's out east below 20
[20:36:12]Eagle3: eagle-03 this is mission terminate you're cleared out east
[20:36:15]Eagle1: eagle-01's ready
[20:36:19]Eagle1: eagle-01 you're cleared on track
[20:36:31]Eagle1: can 01 cobra-03 target 2- groups 0 /10 15 north group **BULLSEYE** 0- 1- 0 /15 22 ,000 track east bogey
[20:36:42]Eagle3: eagle-01 and 2 offset 2- 9- 0 south group **BULLSEYE** 0- 7- 5 /7 28 ,000 track east bogey



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Questions?

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